deresi (white-water valley). The country is covered with copses; and numerous Circassian villages are scattered about. Cirl Buntings and Rosy Finches (*Carpodacus erythrinus*) were for the first time met with, and a good many birds of prey seen.

On the descent to the Black Sea, which occupied two days more, our road lay through large forests, principally composed of beech and oak, with an undergrowth of the golden-flowered *Azalea pontica*. Samsoun was reached on May 22nd. Our intention had been to stop here and collect; but finding that little or nothing was to be done in that way, we left for Constantinople by the first steamer.

Before passing to the next part of this paper we must acknowledge the hospitality and courtesy received from all races and classes, especially from the mountain-tribes of Turks and Yorouks, among whom most of our time was passed. Nothing could exceed the unvarying kindness of Mr. Tattarachi, H.B.M. Vice-Consul at Mersina, to whom we take this opportunity of tendering our most hearty thanks, as also to Mr. Dresser and to Mr. Baker of Kew, for the aid they have rendered us in naming our birds and plants. We would further beg leave to recommend to the ornithological world our assistant, Mr. William Pearse, of Haskeui, Constantinople, who accompanied us, and to whose diligence and care the good preservation of our collection is entirely due.

[To be continued.]

XXIII.—*Recent Observations on the Parrots of the Genus* Eclectus. By W. A. Forbes, F.Z.S.

The large red and green Parrots forming the genus *Eclectus* of Wagler have long been well known to naturalists, who have, until recently, entertained no sort of doubt that the red species were perfectly distinct from the green ones. So much was this the case, that a subgenus, denominated *Polychlorus* in 1857 by Sclater*, has been formed for the reception of the green species, the red ones being retained under *Eclectus* proper. Dr. Finsch, whose excellent work, 'Die Papageien,' must be regarded as our "Standpunkt" in all matters concerning Parrots, recognizes (*l. c.* vol. ii. p. 332) seven species of the genus (as restricted by Wagler), and gives the following table of them:—

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* P. Z. S. 1857, p. 226.

a. *Green Eclecti.*

1. *polychlorus,* Scop. Under wing-coverts and sides red. Wing 10″ 5‴.
2. *intermedius,* Bp. Like the last, but green darker and size smaller. Wing 8″ 9‴.
3. *westermanni,* Bp. Like the last, but without red on sides.

b. *Red Eclecti.*

4. *grandis,* Gm. Band over the upper back and the under surface violet-blue; tail-feathers and under tail-coverts yellow. Wing 10″ 3‴.
5. *cardinalis,* Bodd. Like the last, but darker red; under tail-coverts orange-red. Wing 8″ 5‴.
6. *linnæi,* Wagl. Like the last, but with a narrow blue ring round the eye; under tail-coverts red.
7. *corneliæ,* Bp. Without any blue at all.

The distribution of the species (as given by Finsch) is represented in the following table, the habitat of two species (*E. westermanni* and *E. corneliæ*), both originally described by Bonaparte from specimens living in the "Natura-Artis-Magistra" Gardens at Amsterdam), being still unknown.

	Ceram.	Bouru.	Amboyna.	Ternate.	Gilolo.	Batchian.	Morotai.	Guebè.	Waigiou.	Mysol.	Gage.	Kaisa Island.	Ké Islands.	Aru Islands.	New Guinea.	N. Ireland, &c.
Eclectus																
polychlorus	..	..	..	*	*	*	*	*	*	*	..	..	..	..	*	*
intermedius	*	*	*	..	..	..	..	..	..	..	*	..	..	*		
grandis	..	..	..	*	*	*	*	..	..	..	..	*				
cardinalis	*	*	*													
linnæi	..	..	..	..	..	..	..	*	*	*	*	..	*	*	*	*

This being the case, ornithologists were not a little surprised when Dr. A. B. Meyer announced, on his return to Europe from his adventurous travels in New Guinea and the adjacent islands, that the green species of *Eclectus* were simply the males of the red ones—also that all the so-called species were, in his opinion, referable to one species, and one only, namely *Eclectus polychlorus*. In his paper on this subject in the 'Zoologischer Garten' for May 1874, p. 161, Dr. Meyer says that his attention was first called to the matter by finding that he had determined all the specimens, six in number, of the *E. polychlorus* (green) that he had procured in the Papuan island of Mafoor (in Geelvink Bay) as *males*, whilst nine *E. linnæi* (red) were all *females*. Struck by this curious coincidence, he inquired of his Malay hunters if they knew any thing of the matter. They replied that it was a well-known fact that these green and red Parrots were man and wife. One asserted that he had seen parents of both colours engaged in incubation, one replacing the other. Though Dr. Meyer, warned by former experience, did not trust implicitly to any statements made by his native hunters, these accounts strengthened him in his suspicions; and he determined to investigate the matter thoroughly. Three green *Eclecti* he obtained in Jobie were all males, three red all females. These results were afterwards fully confirmed by the examination of a great number of specimens on the mainland of New Guinea. These were too numerous to bring all back to Europe; but he returned with thirty specimens of the genus, four of which were preserved entire in spirits of wine, as well as a living pair of birds (green and red). To place the parallelism in the distribution of the red and green forms (already noted by Finsch, *l. c.*) in a stronger light, he divides the *Eclecti* into three groups, of which *E. corneliæ* and *westermanni* (the habitats of which are, as already remarked, unknown) constitute one. The other two are:—

polychlorus (green) *linnæi* (red) *grandis* (red)	New Guinea, Waigu, Mysol, Gebè, Gilolo, Batjan, Morotai.

intermedius (green) }
cardinalis (red) } Ceram, Amboyna, Buru.

From this it is clear that "the range of *one green* form (*E. polychlorus*) corresponds with that of *two red* ones (*E. linnæi* and *E. grandis*). "As I cannot hesitate a moment," says Dr. Meyer, "in ascribing the conditions found in *E. polychlorus* and *E. linnæi* from New Guinea, Mafoor, and Jobi to the other allied form (namely, that the green are the males and the red the females of one and the same species), the interesting fact comes out (unparalleled, so far as I know, in the ornis of the whole world), that *differently coloured females correspond to one and the same male in different localities*; for *E. linnæi* and *E. grandis* show at first sight such differences, that, so long as we did not know their true relations to *E. polychlorus,* they were universally considered different species. Thus, therefore, the male remains constant, whilst the female varies." Dr. Meyer then proceeds to show that no theories of "sexual" or "natural selection" can account for these facts, of the causes of which we are completely ignorant. Schlegel (Ned. Tijd. v. d. Dierk. iii. p. 332, 1866), he observes, has already united *E. intermedius* and *E. polychlorus* into one species, the examples from Gebè and Waigiou being intermediate in their characters between these two forms. Moreover an authentic specimen of *E. intermedius* from Ceram, received from the Leyden Museum, and now in the Imperial Cabinet at Vienna, quite agrees with Dr. Meyer's series from New Guinea, Mafoor, and Jobi. Hence *E. polychlorus* (including under this term *E. intermedius*) possesses in different islands three females, differently coloured according to the locality, viz. :—

(1) *linnæi,* in New Guinea, Mysol, Waigiou, and Gebè;
(2) *grandis,* in Gilolo, Batjan, and Morotai;
(3) *cardinalis,* in Ceram, Buru, and Amboyna.

Dr. Meyer then goes on to argue that *E. westermanni* and *E. corneliæ,* both remarkable for being nearly uniform in colour, must also be regarded as forms of *E. polychlorus.* He urges that *E. corneliæ* may well be a fourth female of *E. polychlorus,* as we already know that the females of this species are variable, whilst *E. westermanni*, he considers, is probably an individual that has retained its juvenile plumage and has been unable to assume its adult colouring owing to captivity.

Here I must join issue with Dr. Meyer on several grounds. First of all, several examples of each of these condemned species have lived at various times in the Zoological Gardens of London and Amsterdam, and no noteworthy difference has been detected in these specimens. Again, specimens of both species have lived for considerable periods at Amsterdam without undergoing any change in coloration (*vide* Finsch, *l. s. c.*). Moreover Parrots, as a rule, including those of the present genus, do remarkably well in captivity, and show no tendency to lose or to fail to acquire their brilliant colours or to retain their immature dress. *Eclectus corneliæ* and *E. westermanni* can hardly be man and wife, owing to their disparity in size (the wing of the former being given by Finsch as 9″ 5‴, of the latter 7″ 8‴ to 8″ 5‴, and other measurements in proportion). Hence we may conclude that in the former case the *male*, in the latter the *female*, remains to be discovered, as well as the exact habitat of each. When we reflect on the little knowledge we still have of the great mass of New Guinea, as well as of some of the neighbouring islands, it is evident that ample area for such a discovery is still left. This conclusion is strengthened by the fact that certain other Parrots belonging to the same region, likewise first described from captive specimens, and undoubtedly distinct (e. g. *Lorius tibialis*, Scl. P. Z. S. 1871, p. 499, and *Trichoglossus mitchelli*, G. R. Gray), have their exact habitat still unascertained. The recent discovery of Loriinæ (a group of which the geographical range coincides remarkably with that of *Eclectus*, as has been pointed out by Mr. Wallace) in such unexpected localities as Ponapé (in the Caroline group), where *Chalcopsitta rubiginosa* occurs*, and Fanning Island, in the mid Pacific†, renders it even possible that an *Eclectus* may turn up in some equally "unlikely" locality‡.

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* *Vide* Finsch, 'Journal des Museum Godeffroy,' Heft xii. 1876.

† *Coriphilus kuhli*, P. Z. S. 1876, p. 421.

‡ Prof. Rietmann's "shining-red Parrots" in Guadalcanar (P. Z. S. 1869, p. 127) might well be *E. corneliæ*.

Dr. Meyer then goes on to show that Bernstein's determinations of the sexes of the specimens he forwarded to the Leyden Museum are probably erroneous, as in his three years' experience he found the sexes about equally numerous, whereas Bernstein's determinations would show great disparity in their relative abundance (in one case six males to one female, in the other twelve females to two males). The juvenile plumage of *Eclectus* is unfortunately still unknown; but Dr. Meyer concludes that it is probably green, from the fact that twelve out of fourteen of his red specimens still preserve evident traces of green feathers.

In reply to these arguments Prof. Schlegel* not unnaturally hesitates to accept Dr. Meyer's conclusions, because, of 72 specimens of red *Eclecti* in the Leyden Museum, 20 have been determined by the collectors as *males*, and the remainder (52) as females, and, on the other hand, of 77 green specimens in the same museum, 56 are marked as males and 21 as *females*. Hence, if Dr. Meyer be right, a considerable proportion of these specimens must have been wrongly sexed by the four travellers by whom they were collected, viz. Salomon Müller, Bernstein, Hoedt, and Von Rosenberg.

Dr. Meyer returns to the charge in a paper in the 'Mittheilungen aus dem k.-k. zoologischen Museum zu Dresden' (*l. c.* p. 11–13). He repeats his former observations, and gives some additional ones, amongst which are some remarks on a living pair of *Eclectus* in his possession, green and red, the green bird on being introduced to the red at once having become friendly with the latter. A green *Eclectus* that died soon after it came into his possession was dissected and turned out to be a male. As regards the specimens in the Leyden Museum, Dr. Meyer disposes of them by saying that those collected by S. Müller have been long in the Museum, and may very probably have had their labels transposed—that Bernstein, during the latter part of his residence in the Malay archipelago (as he himself learned from one of his hunters, who had also collected for Bernstein, and knew the latter well), suffered severely from illness, and therefore may well have made mistakes in the determination of the sexes of his specimens—that Hoedt had no pretensions to any scientific knowledge—and that Rosenberg has in other instances made blunders of a similar kind—so that their evidence counts for little. Dr. Meyer adds some mathematical calculations showing that the chances are 32,700 to 1 against his having killed six all males of the green *Eclectus*, and nine all females of the red one in the same island, if they really were distinct species.

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* Mus. Pays-Bas, Psittacidæ, 1874, p. 17.

So far Dr. Meyer. Important evidence in corroboration of part of his theory is given by the Italian naturalists who have lately visited New Guinea. Beccari, in his Ornithological Letters to Count Salvadori*, says, "Though it seems strange, it is nevertheless true that the green *Eclecti* are males of the red ones. I learnt this at Aru from my hunters; and the young have the same differences." Salvadori says again (*l. c.* pp. 756, 757), speaking of the sexual differences in *E. grandis*, that there is "no longer any doubt on this subject. D'Albertis has assured me that it is a well-known fact amongst the natives of the Moluccas and New Guinea." In his various papers on Papuan ornithology in the same journal, the green specimens of *Eclectus* are always determined as males, the red as females.

Prof. Garrod also tells me that during his prosectorship the only two *Eclecti* that have died in the Zoological Society's Gardens were one *E. polychlorus* and one *E. grandis*, respectively male and female. On the other hand, the Rev. George Brown, C.M.Z.S., who has lately sent over to this country such interesting collections from New Britain and the adjacent islands, says, in a letter to Mr. Sclater, dated Sydney, October 22, 1876, "This" (*i. e.* the green and red *Eclecti* being specifically identical) "is a *gross error*. Our attention was directed to this subject; and I am quite sure they are two different birds. We shot the green ones, both male and female." Two skins in the collection are referable to *E. polychlorus* and *linnæi*; the latter is marked female. It is to be hoped Mr. Brown will renew his investigations into this subject, as the determination of the sexes is not always very easy without careful dissection, the suprarenal bodies in birds being particularly liable to be mistaken for the testes when the latter are not developed to the extent that they are during the breeding-season. On the whole, I think, we must conclude, in company with Dr. Meyer and Count Salvadori, that the green *Eclecti* are really males, the red females.

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* Ann. Mus. Civ. Storia Natur. Genova, vol. vii. p. 704, 1875, and Ibis, 1876, p. 253.

With regard to Dr. Meyer's conclusion that all the species hitherto described must be regarded simply as forms of *one* species (*E. polychlorus*), I have already adduced reasons for believing that *E. westermanni* and *E. corneliæ* are good species. As regards the other five, a careful examination of a large series of skins from different localities (we now know that *Eclectus* extends east as far as Yule Island and Duke-of-York Island) will be necessary before coming to any definite conclusion on the subject. Count Salvadori, however, who has probably had as large a series of specimens from different Papuan islands of this genus as anybody, recognizes three distinct species (besides the two of unknown habitat), which he says may always be recognized as distinct at any age or in either sex. He gives the following table of these species as understood by him (*l. c.* p. 756):—

1. Virides: lateribus rubro-puniceis. (Mares.)	
a. Majores.	
a'. Viridis, colore obscuriore, cauda minus cærulea. .	1. *polychlorus.*
b'. Viridis, colore lætiore, cauda magis cærulea	2. *cardinalis* *.
b. Minores. Cauda vix cærulea	3. *grandis* *.
2. Rubræ: fascia interscapulari et abdomine cyaneo vel violaceo. (Feminæ.)	
a. Annulo periophthalmico cyaneo	1. *polychlorus.*
b. Annulo periophthalmico nullo	
a'. Subcaudalibus auroreis vel rubro-flavis	2. *cardinalis.*
b'. Subcaudalibus pure flavis	3. *grandis.*

In this table the green *E. cardinalis* is, I suppose, the *intermedius* of most authors, whilst the red *E. polychlorus* is clearly what is usually called *E. linnæi.*

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* In the original paper Count Salvadori has accidentally transposed these two names, as I have ascertained from a corrected copy of his paper that he forwarded to Mr. Sclater.

On the whole it seems probable that we must be content with ascribing to *Eclectus* the most marked sexual differences in colour of any Parrots hitherto known. *Aprosmictus* (at least in some species, *e. g. A. scapulatus*) also presents very well-marked sexual differences in coloration, and, as Prof. Garrod has shown (P. Z. S. 1874, p. 494), agrees very closely with *Eclectus* in anatomical structure. *Eclectus,* however, differs from all known Parrots in having the female more gaudily coloured than the male. Can it be possible that, as in the few other analogous instances where the female is the more brightly coloured (e. g. *Turnix, Rhynchæa,* &c.*), the duties of incubation devolve on the male? If such be the case, we can easily understand the use of the green coloration being retained by the male. Unfortunately we are still totally ignorant of the habits, nidification, and immature plumage of these Parrots. Let us hope that Signor D'Albertis or Mr. Brown will soon throw some light on this, as well as on the other interesting points noted above, which still require further examination.

In conclusion, supposing that we assume the new views as to the sexual differences of the *Eclecti* to be correct, the following list of the species will show concisely their sexual differences and geographical distribution.

1. ECLECTUS POLYCHLORUS (Scop.).

Maximus: mas viridis colore obscuriore, lateribus rubro-puniceis, caudâ minus cæruleâ: femina rubra, fasciâ interscapulari, abdomine et annulo periophthalmico cyaneis.

Hab. in insulis Papuanis et Moluccanis Ternate, Gilolo, Batchian, Morotai, Guebè, Waigiou, Mysol, Gagè, Ké, Aru, Papua, Nova Hibernia, et Nova Britannia.

2. ECLECTUS GRANDIS (Gm.).

Major: mas viridis, lateribus rubro-puniceis, caudâ vix cæruleâ: femina rubra, fasciâ interscap. et abdomine cyaneis, subcaudalibus purè flavis.

Hab. in insulis Ternate, Gilolo, Batchian, Morotai, et Gagè.

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* *Vide* Darwin's 'Descent of Man,' vol. ii. p. 200 *et seq.* (1871).

3. Eclectus cardinalis (Bodd.).

Minor: mas viridis, *E. polychloro* similis, at colore lætiore caudâque magis cæruleâ distinguendus: femina rubra, fasciâ interscapulari et abdomine cyaneis; subcaudalibus auroreis vel rubro-flavis.

Hab. in insulis Moluccanis Ceram, Bouru, et Amboyna.

4. Eclectus westermanni, Bp.

Minor: mas viridis, lateribus concoloribus. Femina adhuc ignota.

Hab. ——? (Viv. Nat. Art. Mag. et Zool. Soc. Lond.)

5. Eclectus corneliæ, Bp.

Mas ignotus: femina punicea, colore cyaneo neque dorsi neque lateris inferioris ullo.

Hab. ——? (Viv. Nat. Art. Mag. et Zool. Soc. Lond.)

XXIV.—*On a Collection of Birds made by Mr. E. C. Buxton in the District of Lampong, S.E. Sumatra.* By Arthur, Marquis of Tweeddale, M.B.O.U.

(Plates V. & VI.)

The first systematic account of the Avifauna of Sumatra was written by Sir Stamford Raffles* at Fort Marlborough, near Bencoolen, of which settlement Sir Stamford was Lieutenant-Governor. Bencoolen is situated on the western shore of the southern half of the island of Sumatra; and most of the birds enumerated were obtained in the vicinity of Bencoolen itself, or during short trips made into the interior of the district of that name during the years 1819 and 1820, partly by Sir Stamford assisted by Dr. Joseph Arnold, and partly by Messrs. Diard and Duvaucel. These two gentlemen (the first a pupil, the other the step-son of the great Cuvier) were French naturalists, whose services Sir Stamford had secured while on a visit to Bengal. The unfortunate misunderstanding that soon after their arrival in Sumatra occurred

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* Tr. L. S. xiii. pp. 277, 330; Appendix, pp. 339, 340 (dated June 1, 1820; read March 20, 1821). The date of the volume is 1822.